

R

# RESEARCH REPORT

DEMAND PROFILES FOR HIGHER  
DENSITY HOUSING

HOUSING  
AFFORDABILITY  
AND FINANCE  
SERIES



HOME TO CANADIANS  
Canada

## CMHC—Home to Canadians

Canada Mortgage and Housing Corporation (CMHC) is home to Canadians. In everything we do, we help Canadians live in safe, secure homes. As the Government of Canada's national housing agency, we play a major role in Canada's housing industry. CMHC develops new ways to finance home purchases. We encourage innovation in housing design and technology. Our mortgage loan insurance helps Canadians realize their dream of owning a home.

Canadians benefit from our work with public, private and not-for-profit partners to improve the quality, accessibility and affordability of housing everywhere in Canada.

CMHC assistance helps low-income and older Canadians, people with disabilities and Aboriginals live in decent, affordable homes. We create jobs for Canadians with products and services that help the housing industry export its knowledge and skills to other countries.

CMHC's leading-edge research improves the quality and affordability of housing. To help Canadians benefit from our housing expertise and make informed decisions, CMHC has become Canada's largest publisher of housing information. We also have Canada's most comprehensive selection of information about homes and housing.

Canadians can easily access our information through retail outlets and CMHC's regional offices.

You can also reach us by phone at

1 800 668-2642 (outside Canada, (613) 748-2003)

by fax at (613) 748-4069

To reach us online, visit our home page at [www.cmhc-schl.gc.ca](http://www.cmhc-schl.gc.ca)

Canada Mortgage and Housing Corporation supports the Government of Canada policy on access to information for people with disabilities. If you wish to obtain this publication in alternative formats, call 1 800 668-2642.

## **DEMAND PROFILES FOR HIGHER-DENSITY HOUSING**

by  
Andrejs Skaburskis  
School of Urban and Regional Planning  
Queen's University

for  
Fanis Grammenos  
Project Manager  
Canada Mortgage and Housing Corporation

CMHC offers a wide range of housing-related information. For details, call 1 800 668-2642  
or visit our Web site at [www.cmhc-schl.gc.ca](http://www.cmhc-schl.gc.ca)

Cette publication est aussi disponible en français sous le titre: *Profils de la demande de logements de  
secteur à haute densité*, PF0341

This research project was (partially) funded by Canada Mortgage and Housing Corporation ("CMHC"). The contents, views and editorial quality of this report are the responsibility of the author(s) and CMHC accepts no responsibility for them or any consequences arising from the reader's use of the information, materials and techniques described herein.

Canadian Cataloguing in Publication Data

Skaburskis, Andrejs

Demand profiles for higher-density housing

Issued also in French under title: Profils de la demande de logements de secteur à haute densité.

ISBN 0-660-17800-1

Cat. no. NH15-319/1999E

1. Housing forecasting — Ontario — Ottawa Region.
2. Apartments — Ontario — Ottawa Region.
3. High-rise apartment buildings — Ontario — Ottawa Region.
4. Middle class — Housing — Ontario — Ottawa Region.

I. Canada Mortgage and Housing Corporation.

II. Title.

HD7305.S52 1999

363.5'9623'097138

C99-980264-x

© 1999 Canada Mortgage and Housing Corporation. All rights reserved. No portion of this book may be reproduced, stored in a retrieval system or transmitted in any form or by any means, mechanical, electronic, photocopying, recording or otherwise without the prior written permission of Canada Mortgage and Housing Corporation. Without limiting the generality of the foregoing no portion of this book may be translated from English into any other language without the prior written permission of Canada Mortgage and Housing Corporation.

Printed in Canada  
Produced by CMHC

## EXECUTIVE SUMMARY

---

This report examines the demand for higher-density building types in the Ottawa region by analyzing the 1991 Census Public Use Micro Data Files (PUMF). It finds that the duplex and townhouse option is the main substitute for single-family houses. The market share enjoyed by this building type stays relatively constant for households earning between \$40,000 and \$110,000 a year. Increases in housing prices relative to income levels are expected to increase the market share of the medium-density housing type to over 30 per cent. Changing demographic profiles will contribute only a little to the growth of this sector. The increasing proportion of households with women as primary maintainers will increase with the demand for medium-density housing. The increasing proportion of non-family households will increase the demand for units in apartment buildings and contribute to the goal of making cities more compact. However, the change is relatively small and can explain a three per cent shift in the market share from single-family detached housing to the apartment sector. The increase in the proportion of non-family households will tend to reduce the overall demand for medium- and lower-density housing. The increase in lone-parent households and small households formed by couples without children will help maintain the projected share of the medium-density options in the 30 per cent range.

These projections do not account for changes in preferences over time, changes in the relative price of options and changes in the options available on the market. Trends, influenced by recent conditions in Ottawa, have shown an increase over the last 10 years in the share of freehold units going to the townhouse sector. If the factors bringing about this increase continue to exert an effect on the Ottawa housing market over the next 15 years, the share of medium-density housing would be a little larger than 30 per cent, on average, while drawing households away from both the single-family and the apartment condominium markets.

The study shows that the market shares for higher-density housing will increase moderately over the next 20 years. Each household type forms a sizeable component of the market for medium-density housing. This means there is relatively little risk in developing prototypes to attract couples, families with children and non-family households. The main variant is the absorption time for new innovative projects.

The main factors differentiating the single-family homeowners from the owners of medium-density units in the Ottawa market are in descending order of importance:

- the presence of a child in the household;
- the age of the household maintainers (the older, the more likely that the household lives in a single-family detached house); and
- household income (the higher the household's income relative to the price of housing, the greater the chance that the household will buy a single-family house).

The main factor affecting the forecast of demand for apartments will be the income level of future households. Interestingly, the demand for medium-density housing is, on the whole, not affected by income changes. The most important determinant of the future market share for this building type is public policy. In particular, the setting of development cost charge schedules to reflect the true social cost of the differences between higher- and lower-density projects and between greenfield and in-fill projects will change the relative price of the options and increase the market share of medium- and higher-density housing. Land use policy can also change market shares by affecting the price of land zoned for single-family use.

The primary challenge in developing more compact cities is in developing homeownership options within the medium-density housing that

attract family households with annual incomes between \$70,000 and \$90,000. This income range shows the greatest increase in the household's propensity to occupy single-family detached houses after controlling and accounting for the effects of demographic factors and tenure choice.

The report presents four profiles of target groups that may be housed in new medium-density housing. The targets differ in that one entails the least risk by focussing on the people who have the greatest predisposition to occupy duplexes or townhouses. The second is the status quo group consisting of people living in higher-density housing. The status quo profile shows the characteristics of the household currently living in higher-density building types who would expect to occupy these dwellings if there are no changes in the nature of available options, the price of medium-density housing and the price of single-family alternatives. The third profile describes a reasonable marketing challenge that, if met by a successful innovative project, would contribute substantially to the goal of making cities more compact. It includes the households earning between \$70,000 and \$90,000 a year. These households currently have the option of buying single-family houses. The fourth is a composite profile that includes the broad range of household types included in the first three profiles. The analysis and current housing expenditures show that this profile would demand the following

distribution of unit sizes and price ranges in the City of Ottawa and on the suburban municipalities.

The main conclusion developed in this report suggests that the compactness of the city is largely determined by the affluence of its residents. Increasing affluence increases the market share of single-family houses and the spread of cities. The projected demographic changes will only reinforce this tendency as an ageing population increases the proportion of those who can afford single-family houses. The increase in the proportion of non-family households will hold back the growth of the single-family sector but the net effect is positive: its market share is expected to increase as long as incomes rise faster than housing prices. Changes in development cost charge schedules, property tax regimes, land use and transportation planning approaches, growth management strategies, housing finance and mortgage insurance policies are among the vehicles for modifying the spread of cities. Policy, not demographics, will change the trajectory of urban development.

**Proposed size and price distribution for medium-density homeownership units**

| Number of Bedrooms | City of Ottawa         |                      | Suburban Municipalities |                      |
|--------------------|------------------------|----------------------|-------------------------|----------------------|
|                    | Bedroom Distribution % | Price Range (\$000s) | Bedroom Distribution %  | Price Range (\$000s) |
| 1                  | 4                      | 140 - 190            | 2                       | 115 - 150            |
| 2                  | 20                     | 170 - 230            | 10                      | 135 - 170            |
| 3                  | 60                     | 180 - 240            | 70                      | 145 - 180            |
| 4                  | 16                     | 190 - 250            | 18                      | 155 - 200            |

# TABLE OF CONTENTS

---

## 1. INTRODUCTION

|                                  |   |
|----------------------------------|---|
| City and Suburban Profiles ..... | 1 |
|----------------------------------|---|

## 2. CHARACTERISTICS OF DEMAND FOR HIGHER-DENSITY HOUSING

|                                              |    |
|----------------------------------------------|----|
| Household and Housing Types.....             | 3  |
| Changes in Income Levels .....               | 3  |
| The Effect of Past Policies and Trends ..... | 7  |
| Dwelling Size Distributions .....            | 8  |
| Price and Rent Distributions .....           | 10 |
| Tenure .....                                 | 10 |

## 3. DISTINGUISHING CHARACTERISTICS OF DEMAND FOR DETACHED HOUSES AND TOWNHOUSES

|                       |    |
|-----------------------|----|
| The Key Factors ..... | 16 |
| Other Factors .....   | 18 |
| Conclusions .....     | 19 |

## 4. PROFILES OF TARGET POPULATIONS FOR INNOVATIVE HIGHER-DENSITY HOUSING PROJECTS

|                                                           |    |
|-----------------------------------------------------------|----|
| The Characteristics of the Profile.....                   | 20 |
| The Price and Size of Dwellings.....                      | 21 |
| A Unit Mix and Price Ranges for Innovative Projects ..... | 23 |
| Conclusions .....                                         | 26 |

|               |    |
|---------------|----|
| ENDNOTES..... | 29 |
|---------------|----|

## LIST OF FIGURES

---

|                  |                                                                                                                           |    |
|------------------|---------------------------------------------------------------------------------------------------------------------------|----|
| <b>Figure 1A</b> | Household Characteristics by City .....                                                                                   | 2  |
| <b>Figure 1B</b> | Housing Characteristics by City .....                                                                                     | 2  |
| <b>Figure 2A</b> | Dwelling Types by Household Types .....                                                                                   | 4  |
| <b>Figure 2B</b> | Projected Net Stock Additions by Building Type for the Ottawa Region.....                                                 | 5  |
| <b>Figure 2C</b> | Ottawa Single-Family Detached and Duplex/Townhouse Projections<br>as Per Cent of Additions .....                          | 5  |
| <b>Figure 3A</b> | Household Income Categories by Household Characteristics.....                                                             | 6  |
| <b>Figure 3B</b> | Dwelling Characteristics by Household Income Category .....                                                               | 6  |
| <b>Figure 4A</b> | Year of Construction by Dwelling Characteristics .....                                                                    | 8  |
| <b>Figure 4B</b> | Percentage of Townhouses by Period of Construction.....                                                                   | 9  |
| <b>Figure 4C</b> | Starts of Freehold Single-Detached Houses and Townhouses in<br>Ottawa 1984-1997.....                                      | 9  |
| <b>Figure 5A</b> | Bedroom Number by Household Type .....                                                                                    | 11 |
| <b>Figure 5B</b> | Bedroom Distribution by Dwelling Type .....                                                                               | 12 |
| <b>Figure 5C</b> | Household Type by Number of Bedrooms .....                                                                                | 13 |
| <b>Figure 5D</b> | Dwelling Type by Number of Bedrooms .....                                                                                 | 13 |
| <b>Figure 6A</b> | Declared Value of Homes by Building Type .....                                                                            | 14 |
| <b>Figure 6B</b> | Monthly Gross Rent by Building Type.....                                                                                  | 14 |
| <b>Figure 7A</b> | Household Type by Tenure Distribution.....                                                                                | 15 |
| <b>Figure 7B</b> | Tenure Distribution by Building Type.....                                                                                 | 15 |
| <b>Figure 8A</b> | Household Type Profile of Target Populations for the Inner City and<br>Suburban Townhouse Projects.....                   | 24 |
| <b>Figure 8B</b> | Household Type Distribution by Target Groups.....                                                                         | 25 |
| <b>Figure 9</b>  | Distribution of Units by Number of Bedrooms for the City of Ottawa<br>and the Suburban Projects Aimed at Homeowners ..... | 27 |
| <b>Figure 10</b> | Price Ranges for the City of Ottawa and the Suburban Townhouse Projects<br>by Bedroom Number .....                        | 27 |

---

## LIST OF TABLES

|                 |                                                                                                                                               |    |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Table 1</b>  | The Ranked Characteristics Distinguishing the Single-Family House and the Townhouse Buyers.....                                               | 17 |
| <b>Table 2A</b> | Household Type Distribution by Target Group .....                                                                                             | 21 |
| <b>Table 2B</b> | Proportion of Female and Lone-Parent Households by Target Group .....                                                                         | 21 |
| <b>Table 2C</b> | Income Distribution by Target Group.....                                                                                                      | 21 |
| <b>Table 3A</b> | Current Building Types by Target Group .....                                                                                                  | 22 |
| <b>Table 3B</b> | Current Tenure and City Location of Households by Target Group .....                                                                          | 22 |
| <b>Table 4A</b> | Average Estimated Price of Owner-Occupied Dwellings<br>by Building Type and Target Group .....                                                | 23 |
| <b>Table 4B</b> | Average Rents by Building Type .....                                                                                                          | 23 |
| <b>Table 5A</b> | Average Estimated Price of Owner-Occupied Dwellings<br>by Number of Bedrooms and Target Group .....                                           | 24 |
| <b>Table 6</b>  | Proposed Size and Price Distribution for Medium-Density Homeownership<br>Units in the City of Ottawa and in the Suburban Municipalities ..... | 26 |



# 1 INTRODUCTION

---

This study examines the relationship between building types as defined by the relative density of projects and household characteristics. It uses the 1991 Census Public Use Micro Data Files (PUMF) to identify the characteristics that distinguish the demand for four types of dwellings:

- the single-family house;
- the duplex, row, semi-attached and attached options that will be referred to as the duplex and townhouse option;
- the under five-storey apartment building; and
- the highrise apartment.

It considers households as formed by couples with children, couples without children, lone parents, and people living alone or with other unrelated people.

The aim is to develop profiles describing the characteristics of households generating the demand for units in higher-density building types and to identify target populations whose entry into the medium-density housing options would contribute most to the goal of making our cities more compact while maintaining a reasonable level of risk in the marketing of units.

The study starts by examining the 1991 census data to describe the households and housing options of Ottawa residents. It links the propensity of the different household types to occupy each of the four building types with the Canada Mortgage and Housing Corporation (CMHC) long-run projections of households for the Ottawa region. These projections form a basis for the discussion of how changes in income and housing prices may affect future demand. The role of the existing stock is discussed and a base-line projection developed for the proportion of future housing starts that will be in higher-density buildings. The study concludes by describing household profiles that can serve as targets for the development of new higher-density housing options.

## City and Suburban Profiles

The higher land is priced, the less of it is used in the production of real estate services: the higher the value of land, the denser the built form.

The effect of location and land value on housing consumption can be illustrated by comparing the household and housing distributions in the City of Ottawa with those of its surrounding suburban municipalities. Figures 1A and 1B show that the smaller, non-family households have the greatest tendency to live in the City of Ottawa rather than in the suburban municipalities: 74 per cent of the Ottawa census metropolitan area (CMA) non-family households live in the city, and 42 per cent of the city's households are non-family.

The density profiles, as illustrated by the distribution of building types in Figure 1B, show that more than half (58 per cent) of the suburban municipalities' housing stock is in single-family houses, and close to half (49.3 per cent) of the City of Ottawa's units are in either of the two apartment building categories. The most ubiquitous building type in all parts of the region is the duplex and townhouse as both the city and the suburban municipalities have a substantial proportion of their housing stock within this category. The suburban municipalities have proportionally more (27 per cent) duplexes and townhouses compared to the city (21 per cent). Attempts to intensify land use in the suburbs should focus on the duplex and townhouse category.

Figure 1A  
Household Characteristics by City

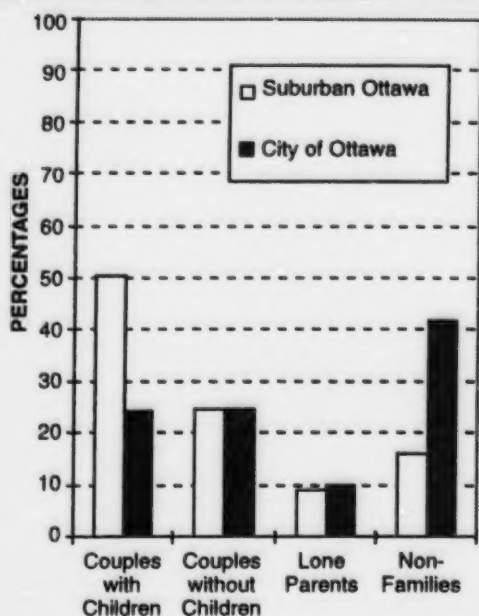
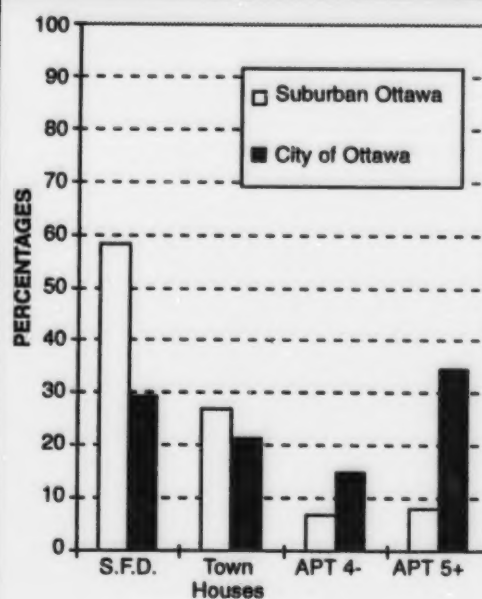


Figure 1B  
Housing Characteristics by City



## 2 CHARACTERISTICS OF DEMAND FOR HIGHER-DENSITY HOUSING

### Household and Housing Types

Figure 2A shows the distribution of the building types across each of the household categories. Couples with children for the most part (65 per cent) occupy single-family detached houses. The couples without children are divided evenly between single-family houses and the three other building types. Lone parents choose the duplex and townhouse option more often (42 per cent) than the other options. Non-family households (45 per cent) most often select apartment buildings over five floors and only 16 per cent occupy single-family houses.

Changes in the demographic composition of the Ottawa population will have an impact on the demand for different types of housing. Applying 1991 building type distributions by household type as depicted in Figure 2A to CMHC's long-range projections of Ottawa households yields the Figure 2B annual housing requirement projections by building type. Assuming that the distribution across building types remains constant, then the increase in Ottawa's population will generate an increasing demand for single-family houses and the rate of increase is approximately the same as for the duplex and townhouse category. The largest proportional increases are in the highrise apartment sector due to the growth in the number of non-family households and the continuing decline in the average household size.

The projections show a near constant market share of single-family detached houses as highlighted in Figure 2C. In part, this is due to projections based on the assumption that future tendencies to select particular types of dwellings remain constant. At least three factors in addition to the demographic trends may change the relative demand for the four different dwelling types.

- Income may increase, giving people a greater chance of occupying the building type they

most want by increasing the range of options that are affordable.

- The price of houses may increase.<sup>1</sup> This would reduce the ability of households to buy larger dwellings and force them to consume less, moving to duplexes or townhouses.
- The stock characteristics will change, giving people a different set of options from which to select their housing.

### Changes In Income Level

The effect of the demographic changes on the relative demand for different types of housing, as illustrated in Figure 2B, is, in part, determined by the variation in the average income of the household types. Figure 3A illustrates the relationship between income and household type by mapping the household type distribution across income levels. Couples and couples with children tend to have the highest incomes and this helps explain their higher tendency to occupy single-family houses. The interrelationship of factors affecting the choice of building type calls for the use of multivariate analysis to identify the unique contribution of each factor. The results of such analysis are presented later.

Figure 3B shows the distribution of dwelling types across households with different levels of income. It shows that households with \$10,000 annual income for the most part (42 per cent) occupy units in apartment buildings with five or more floors. Twenty-five per cent occupy low-rise apartments and a smaller proportion live in duplexes or townhouses (22 per cent) and single-family houses (12 per cent). At the high end of the income scale, most (76 per cent) households live in single-family detached houses. The figure clearly shows that higher incomes are associated with a move away from the apartment options and an increasing tendency to occupy single-family

**Figure 2A**  
Dwelling Types by Household Types

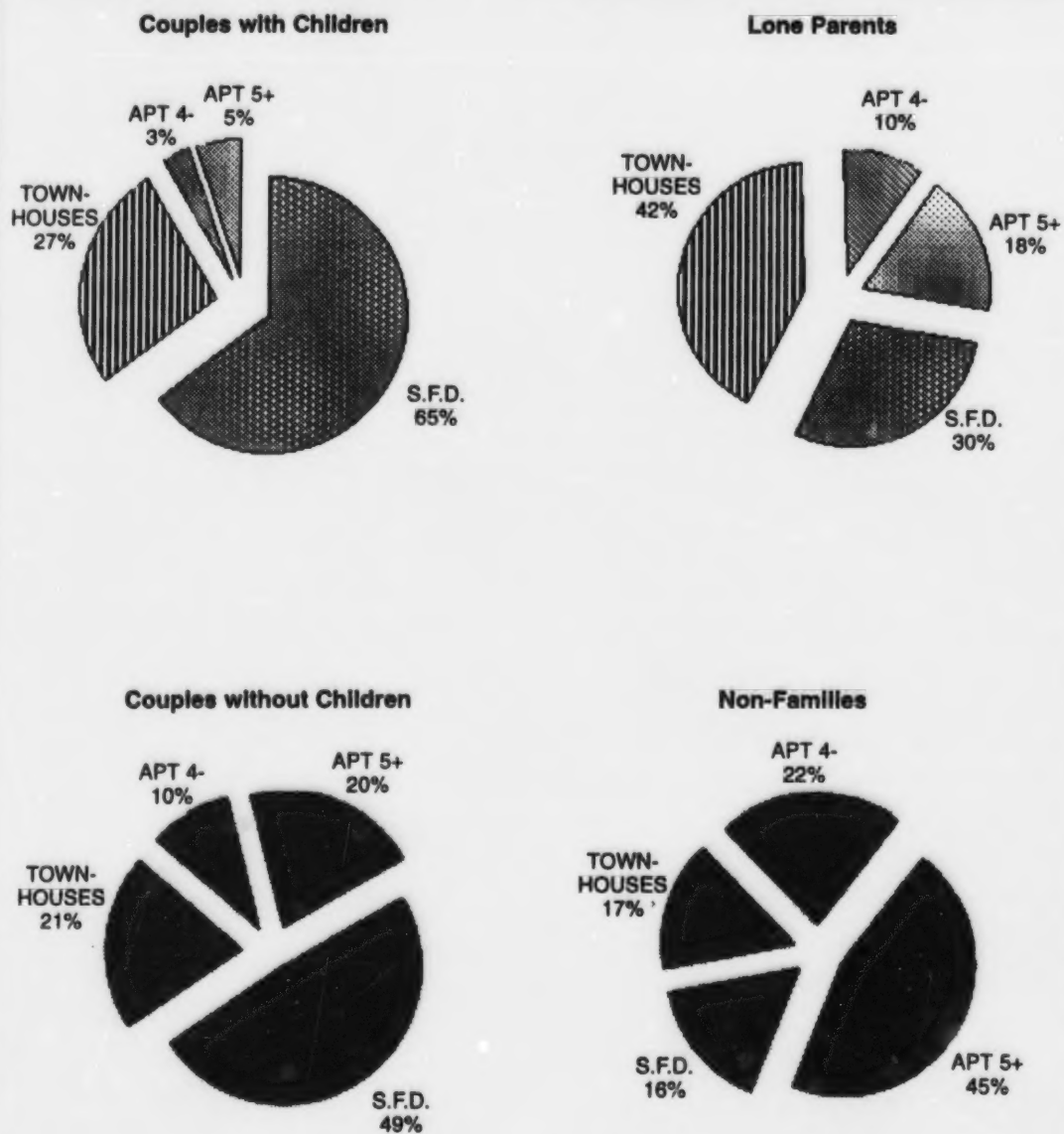


**Figure 2B**  
Projected Net Stock Additions by Building Type for the Ottawa Region

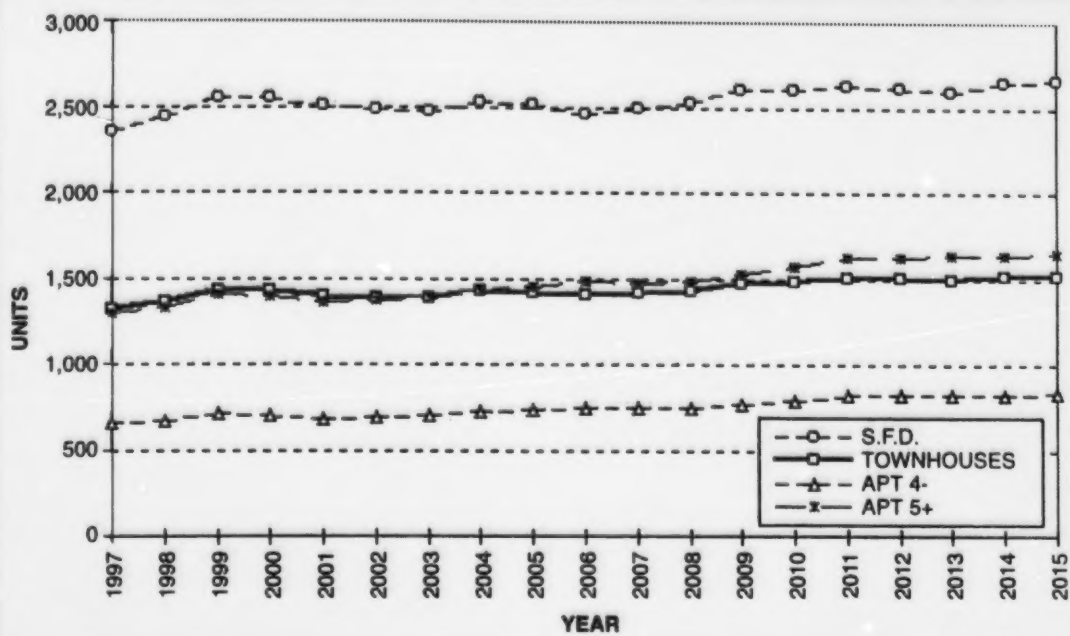


**Figure 2C**  
Ottawa Single-Family Detached and Duplex/Townhouse Projections as Per Cent of Additions

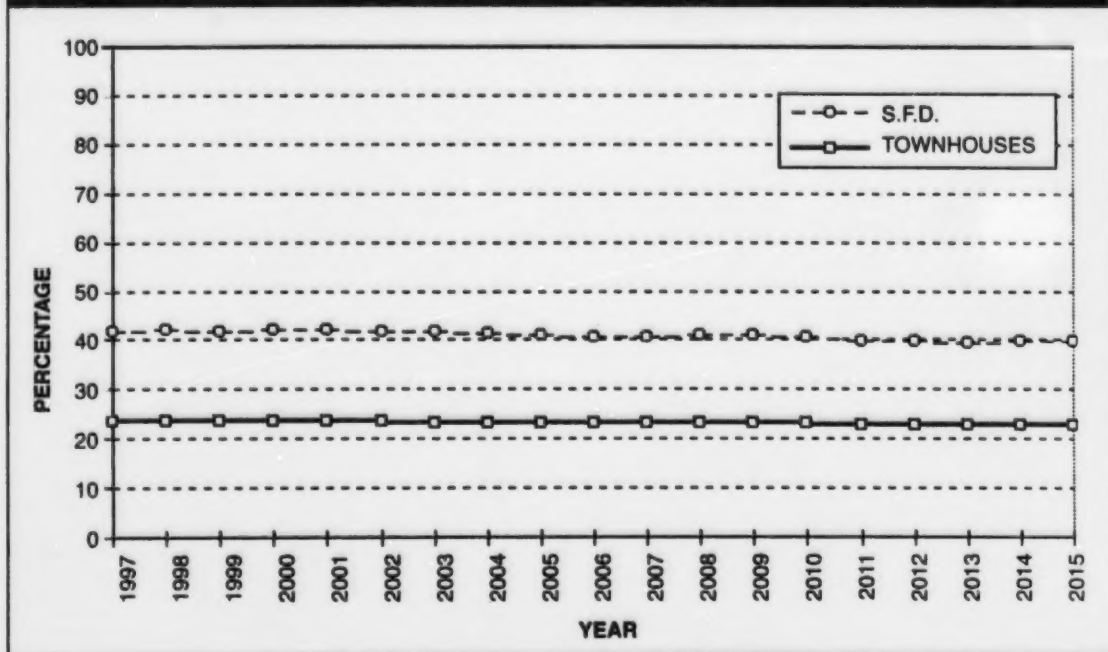


Figure 3A  
Household Income Categories by Household Characteristics

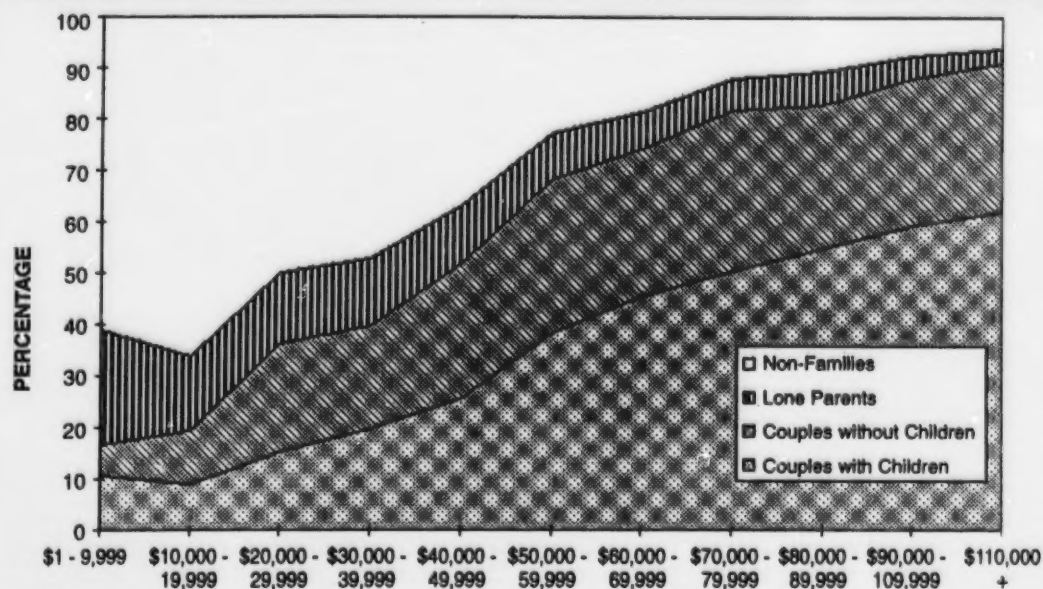
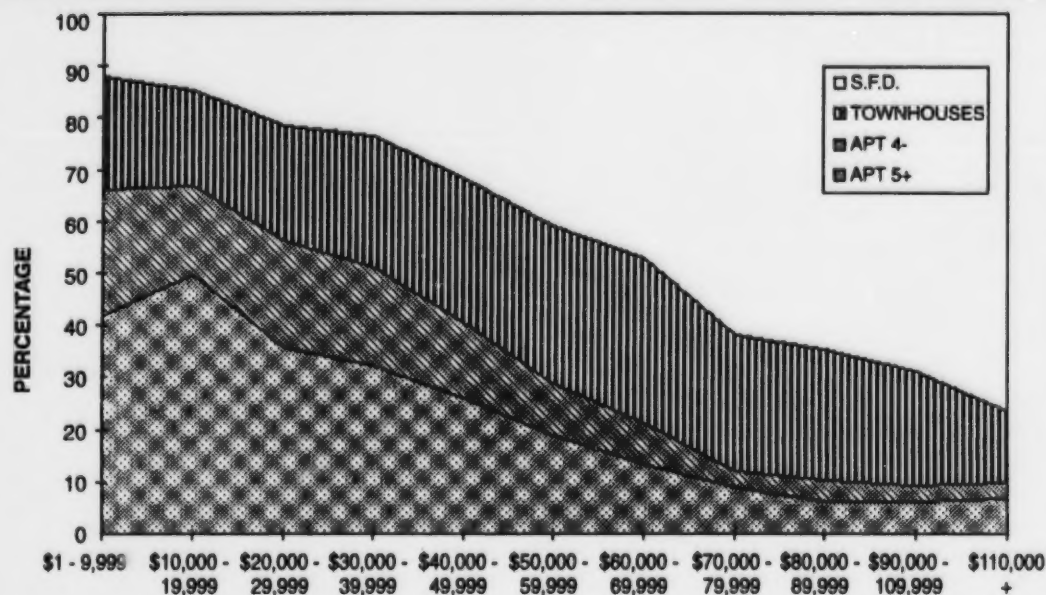


Figure 3B  
Dwelling Characteristics by Household Income Category



houses. However, the proportion of households living in duplexes (including semi-attached houses) or townhouses changes remarkably little across the income categories; between 20 and 30 per cent of households, regardless of their income level, select this building type.

Increases in income over time will increase the market demand for single-family houses, reduce the demand for apartment units and leave the demand for duplexes and townhouses unchanged. If housing prices increase faster than income levels, then the demand for duplexes and townhouses will increase relative to the demand for single-family houses. If housing prices increase in the Ottawa region faster than income levels, then the growth in the duplex and townhouse projection in Figure 2B will be higher, the single-family house projection will be flatter and the market share depicted in Figure 2C will show a shift from the single-family house to the duplex and townhouse category. The exact magnitude of the changes cannot be determined without an in-depth study of demand elasticities.

### **The Effect of Past Policies and Trends**

The projections of demand and the discussion of income and price effects are conditioned by the fact that the observed propensities to occupy different types of dwellings are determined by the stock available for occupancy. And this stock is the result of the preferences of people in the past and of past policies that affected the supply of different housing types. When demand and supply conditions change, the stock adjusts slowly through completions, conversions and demolitions. The long-run projections of demand based on observed propensities to occupy different types of housing are, therefore, affected by the stock that was built in the past to suit the needs of a different population and to reflect the conditions affecting supply. However, should a change in demand or in costs persist over time, then we should expect to observe a trend in stock characteristics over time as new buildings are added in response to the changing conditions. If the market is responsive to consumer demand, then systematic shifts in preferences, income

levels or housing costs will show up as a directional change in the characteristics of the housing stock built during different periods of time. The profile of stock characteristics does not provide a perfect reflection of past trends as demolitions are more likely to reduce the older lower-density stock to make way for higher-density land uses.

Figures 4A and 4B show the distribution of dwelling types by their period of construction. The first figure shows the growth and decline of the highrise apartment sector with a peak in the 1971 to 1980 period that was largely due to tax policy. The figure shows the proportion of single-family houses remaining, more or less, the same across most periods except for the drop in the 1961 to 1980 period as a result of federal tax policies encouraging apartment construction. This figure clearly shows the market's sensitivity to changes in taxation. If the problems due to city spread become serious enough, then the re-establishment of a fair price differential between single-family houses and the higher-density options may require the use of tax policies by all levels of government. At the municipal and regional levels, development cost charge schedules may reflect the differences in the environmental costs of the housing options. Property tax rates that penalize higher-density options may be corrected. Provincial and federal tax concessions might be offered to the owners of higher-density housing to correct for the external costs created by city spread. CMHC's mortgage insurance policies, so important in shaping Canadian cities in the past, might be used as vehicles for changing the direction of urban development in the future.

Figure 4B shows the proportion of the buildings in each age group that are in the duplex and townhouse category and illustrates the surge in the 1961 to 1980 period. The long-run trend shows a gradual increase in the proportion of duplexes and townhouses over the last 80 years from 20 per cent of the market to 25 per cent.

Figure 4C shows the CMHC housing starts for single-family houses and freehold townhouses

since 1984 and illustrates the remarkable increase in the proportion of townhouses being built in the Ottawa area. The changes are inspired, in part, by increases in the cost of single-family houses. While long-term projections cannot be based on a short data series, the Figure 4C trend coupled with the longer trend presented in Figure 4B would allow for a conservative projection of an increase in the proportion of higher-density building types. A reasonable long-run extrapolation would suggest that 30 per cent of the total growth in the future demand for new dwelling units will be in the duplex and townhouse category. The increase in the share will be at the expense of both the single-family and the apartment sector. The increase in the market share to the over 30 per cent range over the long run is justified given the 36 and 45 per cent share of freehold tenure starts in townhouses in 1995 and 1996, respectively, as reported in CMHC's *Housing Market Outlooks*, Autumn 1996. Should housing prices rise relative to income levels, this proportion will increase. Should income increase more rapidly, then the proportion will decrease. *The compactness of the city is determined by the affluence of its residents*

*and by policies that affect the price of single-family houses relative to the cost of building medium- and higher-density housing.*

### Dwelling Size Distributions

The size of dwellings is given in the census by the number of rooms, and figures 5A and 5B show the distribution of bedrooms by household and building type. The three-bedroom unit is the most popular option for couples with and without children and for lone parents. The growing non-family households most often occupy one-bedroom units. About 30 per cent of couples without children and lone parents occupy two-bedroom units and the same proportion of couples with children have four bedrooms.

The household and dwelling type distribution across unit sizes is illustrated in figures 5C and 5D. The single-family house distribution is similar to the distribution of unit sizes for couples with children because developers target the houses to the family market. Duplexes more often have three-bedroom units, and apartments follow with smaller units typically in the higher buildings. Dwelling size

Figure 4A  
Year of Construction by Dwelling Characteristics

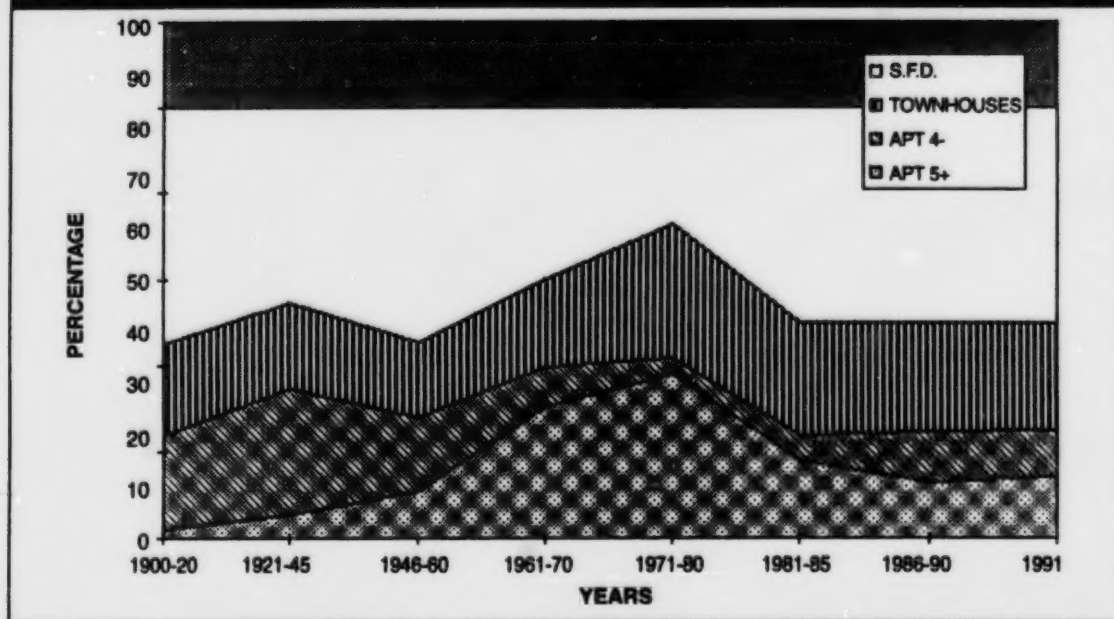


Figure 4B  
Percentage of Townhouses by Period of Construction

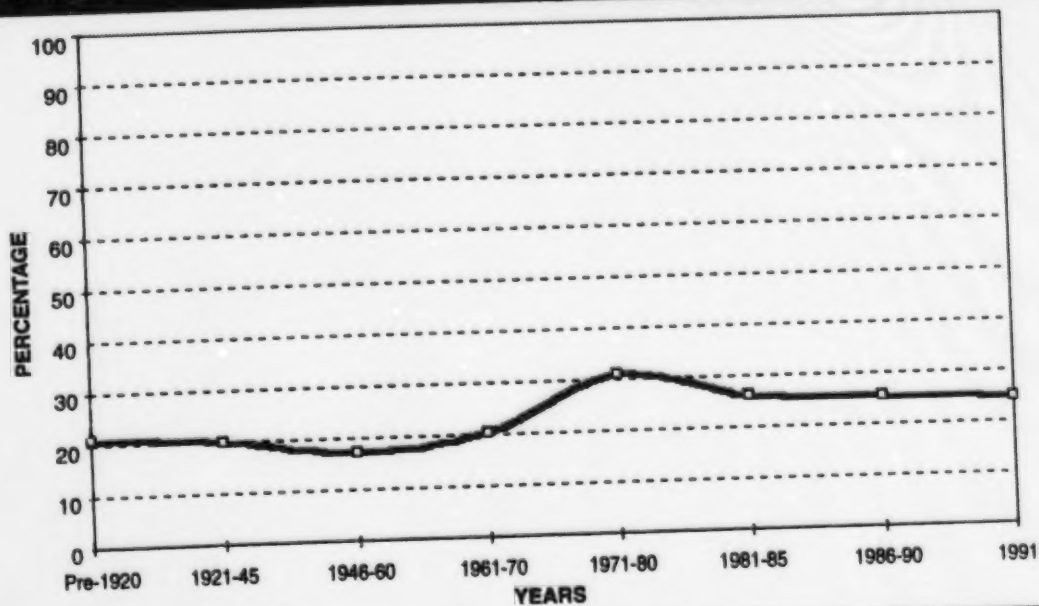
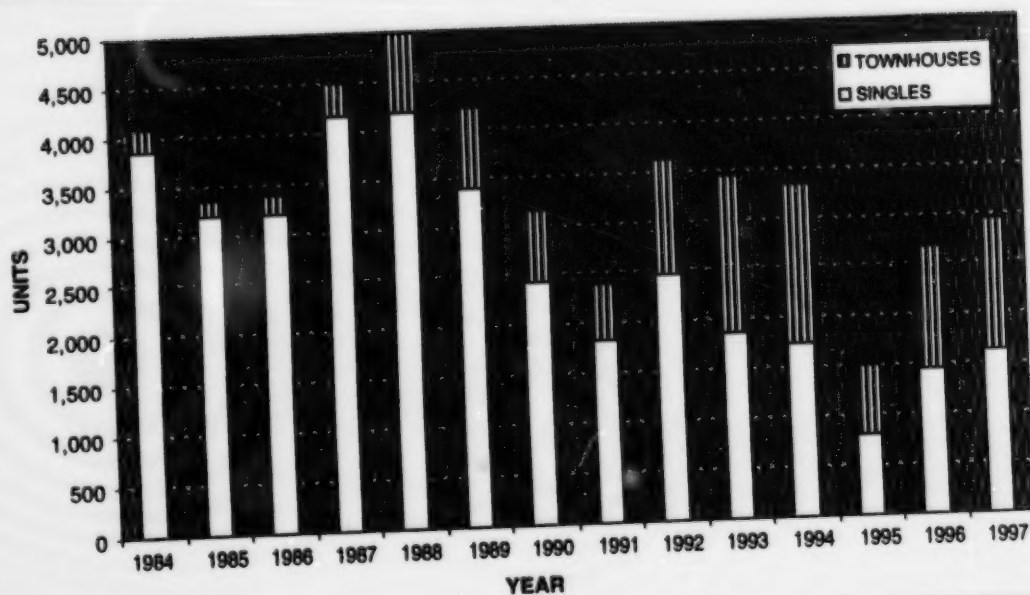


Figure 4C  
Starts of Freehold Single Detached Houses and Townhouses in Ottawa 1984-1997



distributions show the similarity of the single-family houses and the duplex and townhouse group and the difference between these two options and the apartment buildings. The duplex and townhouse category tends to have fewer rooms than the single-family house, and the difference is largely due to the absence of four-bedroom units. Building types are distinguished by their room counts and these are inversely related to the overall density of the building type. This relationship is in line with neoclassical economic theories explaining why smaller and, therefore, less expensive units will be built on the more expensive land closer to the city centres.

### **Price and Rent Distributions**

Figures 6A and 6B show the value of dwellings in 1997 dollars as declared by the census respondents and the rents paid by the different household types within each housing category. Overall, the statistics show that the single-family house is the most expensive option and the other three building types are remarkably similar. The rent profiles show a more gradual decline with density but exhibit less variation across household types in the low-rise apartment category. The differences in the average declared value do not account for differences in dwelling size, period of construction or state of repair. To examine the simultaneous effect of these factors, regressions were run to show how housing prices and rents differ across a range of factors. After controlling for the differences in the number of rooms, age, state of repair and a set of other characteristics describing the occupants, the duplex and townhouse option was found to be 29 per cent less expensive than similar single-family detached houses. The low-rise and highrise apartments are, respectively, 17 and 15 per cent lower than single-family houses in price after accounting for the effect of the size difference. Given the current available options, statistics show that for the dwellings with the same number of rooms and bedrooms that were built in the same period and are in a similar state of repair, the duplex or townhouse is worth almost 30 per cent less than a similar size single-family house. Given the current options, the market is saying that a competitive unit in a duplex or townhouse should be priced about 30 per cent below the price of a single-family house offering the same number of rooms.

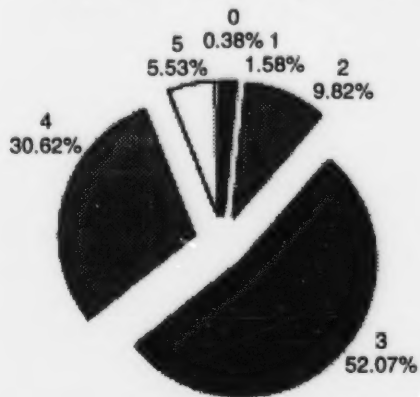
### **Tenure**

Today, homeownership options are available within all building types. Until condominium legislation was introduced in the 1970s, the homeownership option was limited to single-family houses and to the duplex and townhouse category. The quest for homeownership has been associated with the quest for single-family houses to the extent that the two options are synonymous to many people. The goal of attaining homeownership is shared by most Canadians and, with only a few exceptions, the people who can afford homeownership select the option. The universality of this preference is illustrated by the very small number of people who leave homeownership for rental housing unless this household changes as a result of separation or death. Homeownership is also associated with a person's progress through his or her life cycle as illustrated by the progression of tenure ratios in Figure 7A. About one quarter of non-family people own their dwelling and about three quarters of couples with children are homeowners.

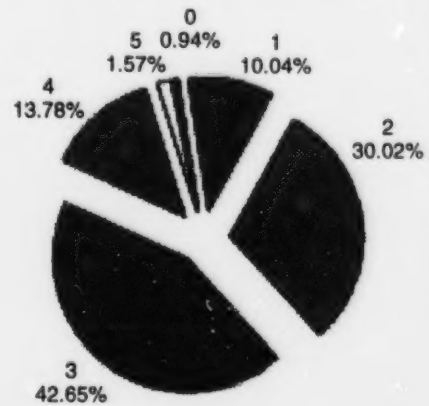
Figure 7B shows the distribution of tenure options across building types. The 91 per cent of single-family houses occupied by homeowners illustrates the degree to which homeownership and the selection of this option are interrelated. The duplex and townhouse option offers the second most popular homeownership alternative. Attempts to intensify cities require the development of homeownership options within the duplex and townhouse category. The development of more rental units within this building type may be counter-productive as the units are likely to draw households away from the more intense land use options afforded by apartment buildings.

Figure 5A  
Bedroom Number by Household Type

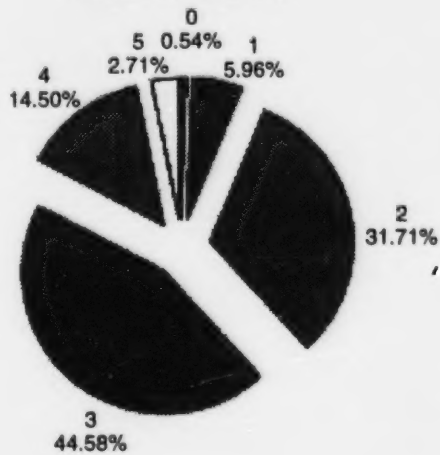
**COUPLES WITH CHILDREN**



**COUPLES WITHOUT CHILDREN**



**SINGLE PARENTS**



**NON-FAMILIES**

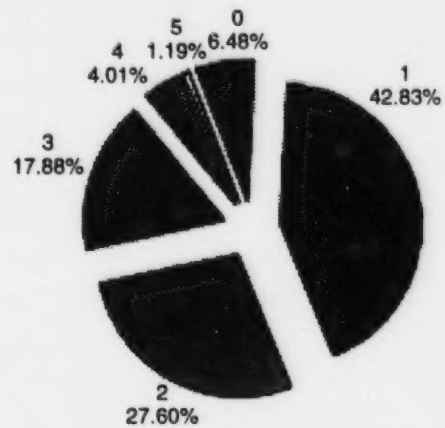


Figure 5B  
Bedroom Distribution by Dwelling Type

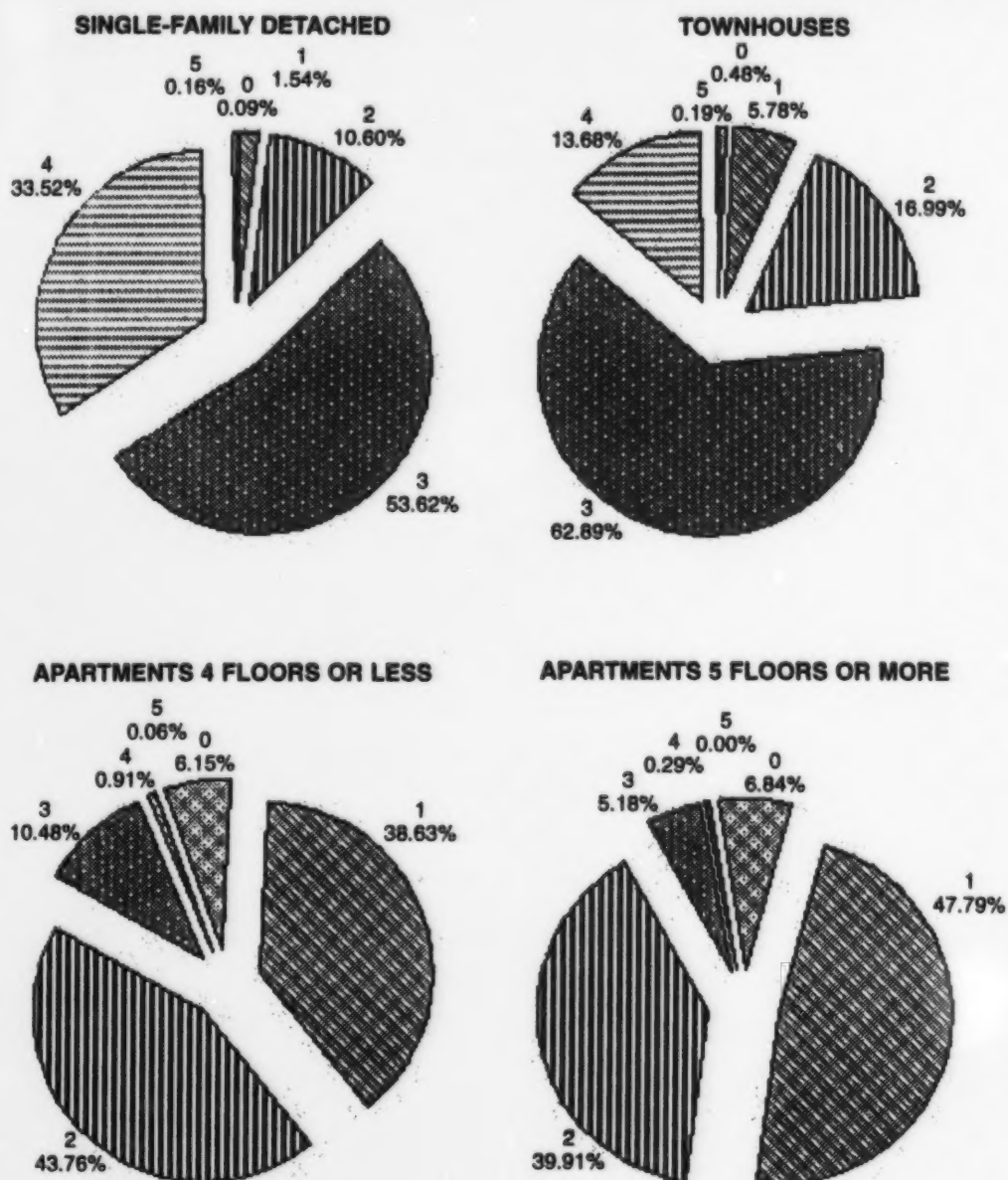


Figure 5C  
Household Type by Number of Bedrooms

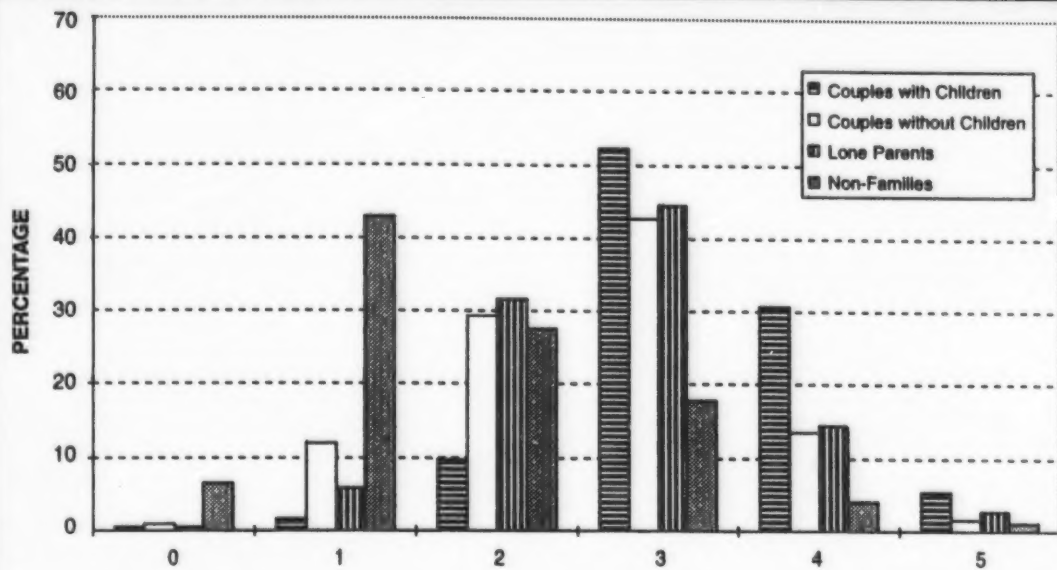


Figure 5D  
Dwelling Type by Number of Bedrooms

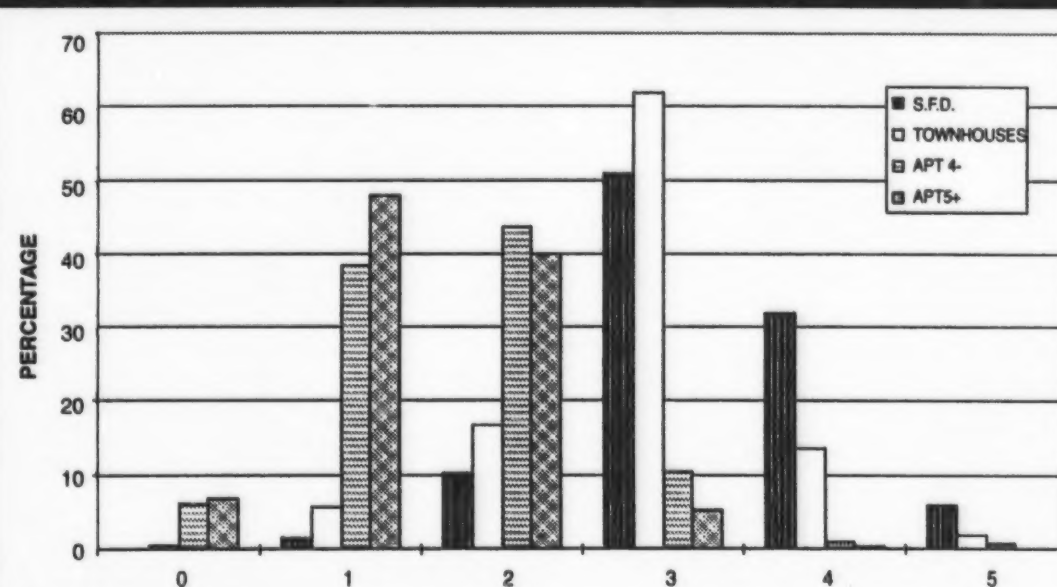


Figure 6A  
Declared Value of Homes by Building Type

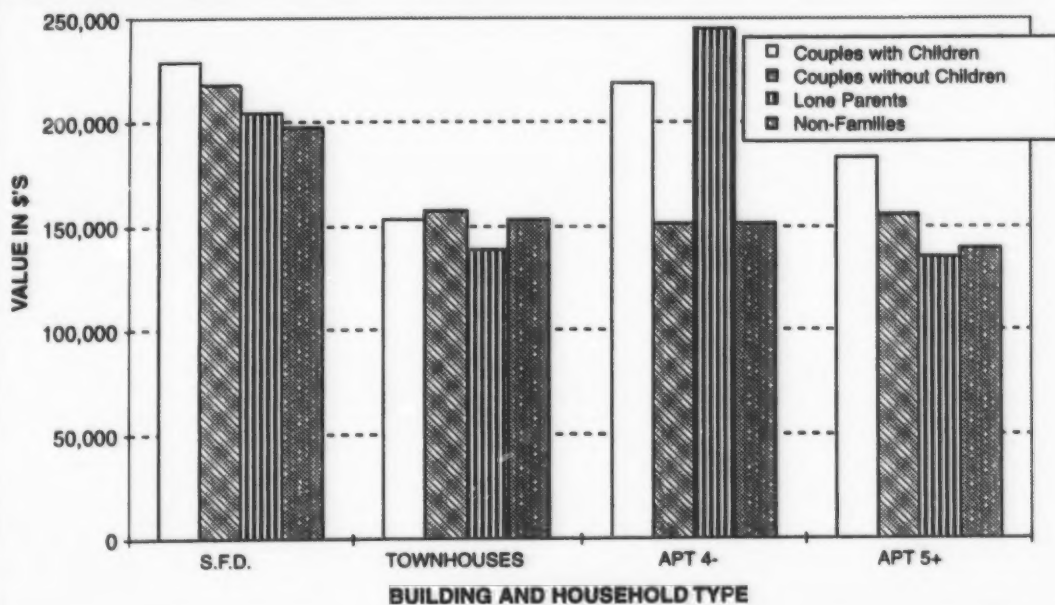


Figure 6B  
Monthly Gross Rent by Building Type

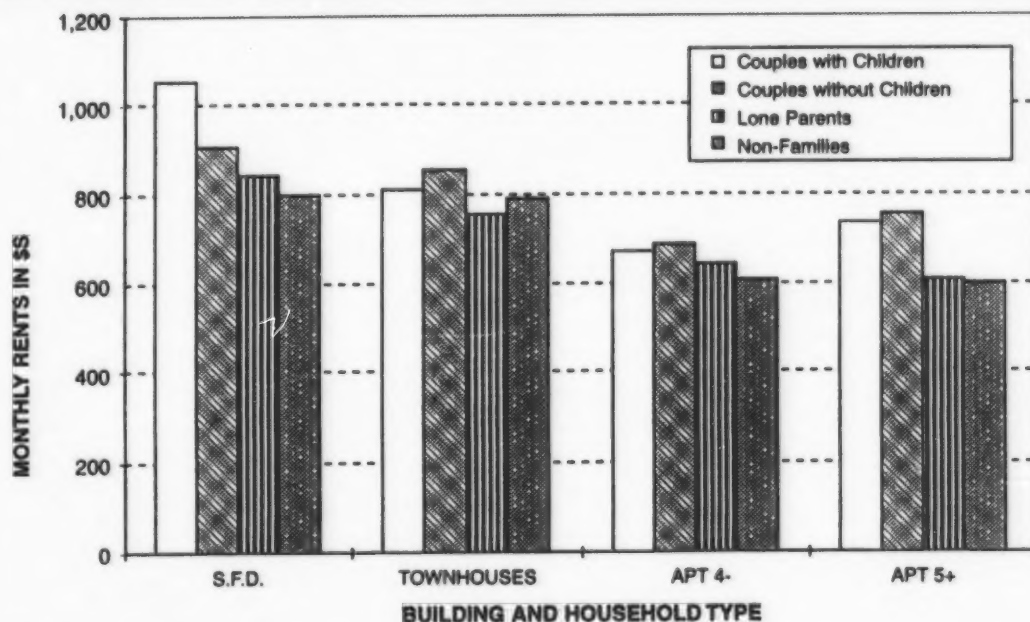


Figure 7A  
Household Type by Tenure Distribution

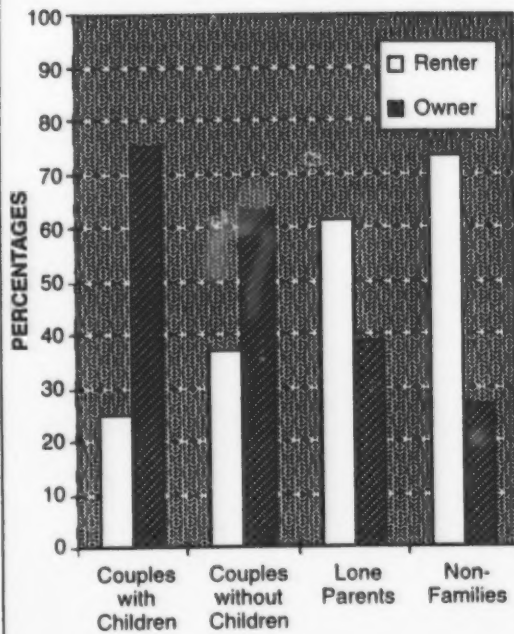
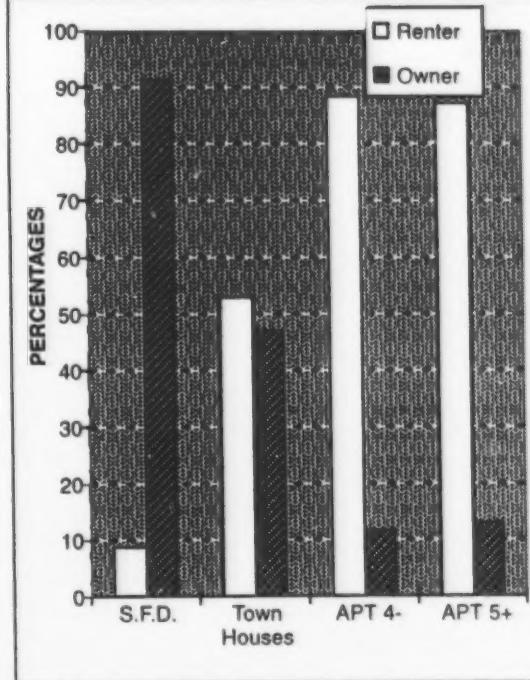


Figure 7B  
Tenure Distribution by Building Type



### **3 DISTINGUISHING CHARACTERISTICS OF DEMAND FOR DETACHED HOUSES AND TOWNHOUSES**

---

#### **The Key Factors**

The relative importance of the factors distinguishing the demand for single-family houses and for the duplex and townhouse option are assessed by looking simultaneously at the set of household and housing characteristics.<sup>2</sup> The logit regression analysis is restricted to the two building types and to homeowners to help focus on the groups that should be targeted by projects that will contribute the most to making cities more compact.<sup>3</sup> Table 1 summarizes the findings by ranking the key differences in the characteristics of the demand for the two building types. The first column shows the probability that the estimated coefficient is different from zero and indicates that there is less than a one in 10,000 chance that most of the factors have no impact on the choice of housing options. Only the relative magnitudes are of interest here. The second column presents the partial odds ratio showing how much each factor contributes to the chance that the household selects a duplex or townhouse over the single-family house. If the factor does not distinguish the market segments, then its value will be close to one. Values larger than one show the extent to which households with that characteristic increase their propensity to occupy medium-density housing. A value of two, for example, shows that the household with the particular characteristic described by the variable has two times the odds (the chance) of occupying a townhouse option in comparison to the chance that a household similar in all other regards has of occupying this building type. Values under one indicate that the household has a greater chance of occupying a single-family house. An odds ratio of 0.5, for example, shows that the household has half the chance of occupying a medium-density housing option.

#### **The presence of children**

The presence of children in a household most strongly distinguishes single-family house buyers and duplex or townhouse buyers from each other. If all other household characteristics were the same, then the odds of finding couples with children compared to non-family homeowners with the same income in a duplex or a townhouse is 0.436 to one. Couples with children show a strong preference for single-family houses even after accounting for the effects of income, age, immigration status and mobility. If a household without children had a 50 per cent chance of living in a duplex or townhouse, then a similar household with a child would have a 30 per cent chance of living in the higher-density option.<sup>4</sup> Another way of interpreting these statistics suggests that if half of a particular group of non-family households were to live in duplexes or townhouses, then a group that is similar except for family status would have 30 per cent of its households living in duplexes or townhouses. The odds ratios listed in Table 1 can be translated into market shares.

#### **Age of maintainer**

Age of maintainers is the second factor distinguishing the owners of single-family houses from those of duplexes and townhouses. For each 10-year difference in the age of the household's primary maintainer, the odds of living in a townhouse drop by a factor of 0.792 to one. If at the age of 35 a household had a 50 per cent chance of living in a duplex or townhouse, then the chance the household would live in a duplex or townhouse rather than a single-family house 10 years later, holding income and all other factors constant, would be 44.2 per cent. Since the effects of income are accounted for in the regression, the effect of age is likely through its contribution to the household's wealth. Older households have had more time to build equity and to trade up in the housing market.

**Table 1**  
The Ranked Characteristics Distinguishing the Single-Family House and the Townhouse Buyers

| Factor                    | Probability<br>Equal to Zero | Odds<br>Ratio |
|---------------------------|------------------------------|---------------|
| Couple with children      | 0.0001                       | 0.436         |
| Maintainer's age          | 0.0001                       | 0.792         |
| Household income          | 0.0001                       | 0.994         |
| Moved in last five years  | 0.0001                       | 1.737         |
| Couple without children   | 0.0001                       | 0.575         |
| City of Ottawa location   | 0.0004                       | 1.359         |
| Female primary maintainer | 0.0128                       | 1.294         |
| Recent immigrant          | 0.0057                       | 2.028         |

### Household Income

Household income is the third factor distinguishing the sub-markets in the Ottawa area with each \$1,000 increase in income reducing the odds of a homeowner living in a duplex or a townhouse rather than a single-family house by a factor of 0.994.<sup>5</sup> This means that a \$10,000 increase reduces the odds of living in a townhouse by  $0.994^{10} = 0.942$ . If a household had a 50 per cent chance of living in a townhouse, then the same household, but with \$10,000 more income, would have a 48.5 per cent chance of being in a townhouse.

### Recent buyers

Whether or not the household had moved in the last five years distinguishes the occupants of houses from occupants of duplexes or townhouses.<sup>6</sup> If all the other factors identified in this list were the same, then the household that had moved in the last five years would have a 1.737 greater chance of having bought a townhouse than a single-family detached house. If a household living in the same unit for more than five years had a 50 per cent chance of occupying a townhouse, then the similar household that had moved in the last five years would have a 63.5 per cent chance. This finding is due to the recent increase in the market share enjoyed by the townhouse option within the homeownership market. The supply change itself is a reflection of developers' assessments of current market demand. The increasing uncertainty with regard to employment stability and the increasing cost of residential development in the Ottawa

region may have temporarily reduced the proportion of households able to enter the homeownership market by buying a single-family house.

### Couples without children

Couples with no children tend to be owners of single-family houses with a partial odds ratio of 0.575. These households may be planning to have children or they may stay in their house as empty nesters. If a non-family homeowner gets married, the chance that the household would stay in the duplex or townhouse would drop from 50 per cent to 36.5 per cent. The change is not as large as with the addition of a child.

### City of Ottawa location

City of Ottawa owners as opposed to homeowners living in the suburbs have a 1.359 greater chance of occupying a townhouse than a single-family house. This is obviously due to historical supply conditions. Theoretical explanations of the urban density gradients are based on the view that households make tradeoffs between higher density (a bad) and improved access to the centre (a good). They are willing to put up with higher densities as a result of the urban amenities and the access to convenience gained by central locations. It is interesting to note that the focus groups examining density options did not identify the tradeoffs as being important in their assessment of the suburban and inner-city medium-density prototypes developed by Quadrangle Architects Limited.<sup>7</sup>

### **Female maintainers**

Female primary maintainers tend to favour townhouses with an odds ratio of 1.294. If a household with a male primary maintainer had a 50 per cent chance of living in a duplex or townhouse, then the similar household, but with a female primary maintainer, would have a 56.4 per cent chance. As more women become the household's primary maintainer, the demand for duplexes and townhouses will increase.

### **Recent immigrants**

Recent immigrants will be more likely than others to buy townhouses as opposed to single-family houses. However, with time, immigrants move to single-family houses indicating that the difference may be due to the recent immigrants' lack of wealth.

### **Other Factors**

The characteristics of the housing sub-markets were examined by looking at homeowners and their choice of a medium-density option over the single-family home as described above. In the analysis of Ottawa households, no difference in choice could be attributed to the lone parent status of the household maintainer after accounting for the other factors such as income and age. Similarly, only a weak effect could be assigned to the retirement status of the household and the effect that might have been observed indicated that retired people select single-family homes slightly more often than others even after the effect of their age has been controlled for. These results suggest that the ageing of the population will not help the Ottawa region become more compact. Indeed, the ageing of the population will mean that more people will have the down payment for a single-family house.

A greater degree of discernment could be developed by analyzing the differences between the markets for single-family detached houses and all other higher-density building options. When the effect of tenure choice is ignored, then we find that the most important factor distinguishing the sub-markets is the location of the housing: people choosing to live in the City of Ottawa have a

much greater chance (3.8 times the odds) than suburban residents of living in a higher-density housing type. The second factor is the household's mobility as indicated by having moved recently. Households moving within the last five years have an odds ratio favouring the higher-density options that is 2.4 times greater than that of other households with similar characteristics but who have not moved in the last five years. Older households tend to live in single-family houses and retirement makes no difference to their propensity to occupy one or other building type. Household size is an important factor in distinguishing the markets with larger households tending to occupy single-family houses.

Recent immigrants, as well as households formed by women primary maintainers or people who have separated from a prior marriage, have a greater propensity to occupy dwellings in higher-density building types than others with the same income and age. Empty nesters could not be distinguished from other couples. Lone parents more often live in single detached houses when all the other factors are accounted for. The presence of children makes a big difference but the age of the children does not: households with preschool or school-aged children have the same tendency to favour single-family houses.

Income could be examined in greater detail with this model, and the general observation that increases in income lead households into the single-family detached sector could be refined to show that the largest differences are between households earning just under \$80,000 and just over \$80,000 a year. After all the demographic factors are accounted for, \$80,000 appears as a threshold income level that allows households to enter into the Ottawa single-family detached market.

After removing from further consideration the occupants of single-family houses, the analysis can distinguish between the occupants of the medium-density duplex, rowhouse and townhouse option and the people living in apartment buildings. The most important factors distinguishing between these two sub-markets are as follows:

- Household size: larger households prefer the medium-density housing option.
- City of Ottawa residents tend to live in apartment buildings.
- Retired persons tend to select apartment buildings.
- Households with children choose the medium-density options over apartments.
- Households with income over \$110,000 a year who do not live in single-detached houses tend to select apartments rather than the available medium-density options.
- Lone parents select medium-density housing rather than apartments.
- Recent immigrants tend to select the apartment option.
- People who have moved in the last five years tend to select apartments.

The sub-markets formed by apartments with four or fewer floors as opposed to higher buildings are distinguished in decreasing order of importance as follows.

- Older households select the highrise option.
- City of Ottawa residents have a greater tendency to occupy highrise buildings.
- Larger households tend toward the low-rise options.
- Retired persons more often select the higher buildings.
- Households of Asian origin more often select the higher buildings.

## **Conclusions**

The analysis of the factors distinguishing the sub-markets formed by different building types can be used in two ways. It can show the characteristics of the households that are the easiest to draw to the higher-density building forms. These form the lowest-risk profiles for developers to target. However, the analysis in the earlier parts of the paper showed that the medium-density housing options appeal to a wide variety of households and that there is no "excluded" household type from any of the options. The alternative also appeals to people of varying income levels. The medium-density option is a robust one serving a wide market spectrum.

In general, projects of all types can be built and can expect success, at least, over the long run. The risk will be in the time needed to absorb the units and will be primarily created by developers building units that come on the market after other developers have already saturated the sub-market. The risk might be reduced by seeking to build innovative projects that appeal to specific sub-markets. One way to interpret the findings of this report is to focus precisely on the households showing a tendency to occupy single-family detached houses, i.e., the households in Table 1 with odds ratios below one. This is the market segment most likely to be ignored by developers who do not do detailed market analysis as it presents an "atypical" profile. It may, therefore, remain the segment least likely to be saturated with available medium-density housing options. In addition, the goal of making cities more compact may best be pursued by attempting to develop design options that are attractive to traditional young family homebuyers with an income over \$70,000 a year. The next chapter describes, in more detail, the kinds of market profiles that can be attracted to the medium-density homeownership market.

## **4 PROFILES OF TARGET POPULATIONS FOR INNOVATIVE HIGHER-DENSITY HOUSING PROJECTS**

---

Three profiles are developed to show the characteristics of the markets that can be targeted by innovative higher-density projects. Their main distinguishing feature is the level of risk entailed in marketing the project and the potential size of the contribution of a successful project in making cities more compact. The risk and the impact criteria work against each other: the higher the risk, the greater the potential beneficial impact of a successful project. No single project has to aim at a single market profile, but projects can be designed to attain a balance between reduction in risk and the potential for beneficial impact. As mentioned in the last section, the risk is largely due to the earlier than expected saturation of a sub-market leading to longer than expected absorption times. Paradoxically, developers may reduce this risk by occasionally aiming at the thinner but less traditional medium-density markets.

The first profile describes the households most likely to occupy medium-density housing as a result of their characteristics. Many of these households are currently not living in duplexes or townhouses but may be drawn from the three other building types considered here. The second profile describes the lowest-risk market as it presents a profile of the households currently living in duplexes or townhouses. The third profile describes the challenge group—the households leaving higher-density housing for single-family detached houses. A final fourth profile is developed by combining the three groups and is used to help develop a building program for the development of prototypes.

The first profile is based on a statistical prediction of the probability that a household would select a dwelling type other than a detached house.<sup>8</sup> A sub-sample is drawn from the census file to select the households that have at least a 75 per cent chance of living in a duplex or townhouse. This sub-sample includes some people currently living in single-family houses but having the

other characteristics that make them very good candidates for new higher-density options. The characteristics of this sub-sample are described to form the profile that will be referred to as the low-risk group.

The second target is composed of the population currently living in any of the higher-density housing options. As this group is already living in higher-density housing, it is the lowest-risk profile for new projects and is, therefore, the least interesting from the point of view of changing urban densities. This profile describes the status quo.

The third profile for new projects presents the highest-risk market but the one that offers the highest payoff if the projects are successful. The profile is formed by the households beginning to leave the higher-density options in favour of single-family detached houses as a result of household income rising above the \$70,000 to \$80,000 threshold. This is the high payoff group.

### **The Characteristics of the Profile**

Tables 2A, B and C show that non-family households make up almost half of the status quo target but only 10 per cent of the high-payoff group. Families with children make up 25 per cent of the status quo target and 58 per cent of the high-risk group. The variation across the older households whose children have left, empty nesters and retired individuals is much smaller absorbing about 20 per cent of units aimed at each of the three targets. Table 2B shows the differences in the proportion of households with women declared as the primary maintainer and the proportion of lone-parent households. The high-payoff group includes half the proportion of lone parents as do the other two groups and half the proportion of households with a female as a primary maintainer. Table 2C illustrates the differences in the income levels of the low-risk profile and status quo group.

### The Price and Size of Dwellings

Tables 2A, B and C describe the type of housing currently occupied by the three groups and tables 3 and 4 list the value of the house or the rent paid by building type and by number of bedrooms. The rent statistics are included to show the monthly outlays of the people who are not yet homeowners. About one in four households in

both the low-risk target and high-payoff group currently occupy a duplex or townhouse. The large differences are in the single-family category as expected. About 40 per cent of the low risk and the status quo targets currently live in apartment buildings with five storeys or more. In all three profiles, the proportion of households currently living in highrise apartment buildings is twice as great as in lower apartment buildings.

**Table 2A**  
Household Type Distribution by Target Group

| Household Type                | Target Group  |                 |                  |
|-------------------------------|---------------|-----------------|------------------|
|                               | Low Risk<br>% | Status Quo<br>% | High Payoff<br>% |
| Non-family households         | 47            | 34              | 10               |
| Couples under 45 without kids | 11            | 10              | 13               |
| Preschool kids present        | 9             | 12              | 18               |
| School-age kids present       | 16            | 23              | 40               |
| Couples 45-64 without kids    | 2             | 4               | 9                |
| Over 65                       | 15            | 17              | 11               |

**Table 2B**  
Proportion of Female and Lone-Parent Households by Target Group

|             | Target Group  |                 |                  |
|-------------|---------------|-----------------|------------------|
|             | Low Risk<br>% | Status Quo<br>% | High Payoff<br>% |
| Female      | 56            | 45              | 24               |
| Lone parent | 12            | 12              | 6                |

**Table 2C**  
Income Distribution by Target Group

| Income              | Target Group  |                 |                  |
|---------------------|---------------|-----------------|------------------|
|                     | Low Risk<br>% | Status Quo<br>% | High Payoff<br>% |
| \$1,000 - \$19,999  | 30            | 20              | 0                |
| \$20,000 - \$29,999 | 18            | 13              | 0                |
| \$30,000 - \$49,999 | 32            | 26              | 0                |
| \$50,000 - \$69,999 | 14            | 19              | 0                |
| \$70,000 - \$89,999 | 4             | 11              | 100              |
| \$90,000 and over   | 2             | 11              | 0                |

Table 3B shows the proportion of homeowners within the first two groups to be small while the high-payoff group consists mostly of homeowners. The difference in tenure profiles would make it hard to adjust projects for risk in absorption rates. The most secure part of the higher-density market is in the rental sector while the greatest challenge to planners trying to make urban growth more compact is in attracting homeowners to the duplex and townhouse options.

Tables 4A and 4B list the average market value and the gross rent by building types. The 1991 census statistics were adjusted upward by 14 per cent to account for the general level of inflation. The small proportion of the low-risk group that lives in single-detached units owns dwellings that

are about as expensive as that of the high-payoff group. The value of the duplexes and townhouses for the three groups is the same. The biggest differences are in the apartment condominiums. The highest prices are paid by the small proportion of the high-payoff group living in highrise buildings. The rental markets illustrated in Table 4B are more diverse across the three groups with average prices differing by as much as 20 per cent. Tables 5A and 5B show the average price and rent by the number of bedrooms in the dwelling. The difference in the price of three-bedroom apartments between the low-risk and the high-payoff groups is small. The average price of four-room condominiums differs by about 10 per cent. As before, rent differences are larger, suggesting that this market segment is more diverse.

**Table 3A**  
Current Building Types by Target Group

| Dwelling Type             | Target Group  |                 |                  |
|---------------------------|---------------|-----------------|------------------|
|                           | Low Risk<br>% | Status Quo<br>% | High Payoff<br>% |
| a. Single detached        | 12            | 0               | 60               |
| b. Attached/duplex/row    | 23            | 42              | 28               |
| c. Apartment - 4 or under | 22            | 20              | 5                |
| d. Apartment - 5 or more  | 43            | 38              | 9                |

**Table 3B**  
Current Tenure and City Location of Households by Target Group

|                       | Target Group  |                 |                  |
|-----------------------|---------------|-----------------|------------------|
|                       | Low Risk<br>% | Status Quo<br>% | High Payoff<br>% |
| Per cent owners       | 20            | 27              | 75               |
| Per cent central city | 82            | 65              | 39               |

**Table 4A**  
Average Estimated Price of Owner-Occupied Dwellings by Building Type and Target Group

| Dwelling Type          | Target Group  |                 |                  |
|------------------------|---------------|-----------------|------------------|
|                        | Low Risk<br>% | Status Quo<br>% | High Payoff<br>% |
| Single detached        | 198           | na              | 207              |
| Attached/duplex/row    | 142           | 153             | 154              |
| Apartment - 4 storeys  | 154           | 175             | 199              |
| Apartment - 5+ storeys | 132           | 148             | 166              |

**Table 4B**  
Average Rents by Building Type

| Dwelling Type          | Target Group  |                 |                  |
|------------------------|---------------|-----------------|------------------|
|                        | Low Risk<br>% | Status Quo<br>% | High Payoff<br>% |
| Single detached        | 830           | ne              | 1,165            |
| Attached/duplex/row    | 739           | 802             | 898              |
| Apartment - 4 storeys  | 624           | 634             | 788              |
| Apartment - 5+ storeys | 611           | 645             | 808              |

### A Unit Mix and Price Ranges for Innovative Projects

The greatest range of household types is found in the duplex and townhouse category, yet the market value of the dwellings is remarkably similar. A combined profile can be developed to illustrate a reasonable target population for innovative medium-density projects. The ideal building program would target its units to attract the households tending to buy single-detached dwellings. The proposed profile consists of all households who are:

- in the low-risk group as defined previously;  
or
- currently living in duplexes and townhouses;  
or

- having a household income between \$70,000 and \$90,000 a year.

For the City of Ottawa, the middle price range of medium-density housing in 1991 was set between \$160,000 and \$220,000 (1996). For the rest of the region, the middle price range is between \$135,000 and \$170,000.

These three criteria were used to select households from the 1991 PUMF to form a composite sample that included 2,042 households. This sample can serve as an illustration of the target markets and profiles developed as a basis for a building program. Half of this sample currently lives in the City of Ottawa and the other half in the surrounding municipalities indicating that half the projects can be located in the city and suburbs. The distribution

by household type of the homeowner target for the two parts of the Ottawa region is shown in Figure 8. In the City of Ottawa, between 30 and 40 per cent of the townhouse units would be occupied by families with children and 40 per cent by empty nesters or older couples and non-family households. In the outlying municipalities, the family with children would form 60 per cent of the population and older households decrease to 10 per cent. The potential to attract households headed by women is

higher than is currently being achieved within this building type. The primary maintainer may be women in 40 per cent of the City of Ottawa housing and in 30 per cent of the suburban projects. The design and marketing of the projects should consider the needs of households headed by women as well as the needs of the older households who may be induced to leave their single-detached house after their children have left home.

**Table 5A** Average Estimated Price of Owner-Occupied Dwellings by Number of Bedrooms and Target Group

| Number of Bedrooms | Target Group |              |               |
|--------------------|--------------|--------------|---------------|
|                    | Low Risk %   | Status Quo % | High Payoff % |
| 1                  | 127          | 139          | 164           |
| 2                  | 157          | 151          | 179           |
| 3                  | 167          | 153          | 178           |
| 4                  | 204          | 169          | 229           |

**Figure 8A** Household Type Profile of Target Populations for the Inner City and Suburban Townhouse Projects

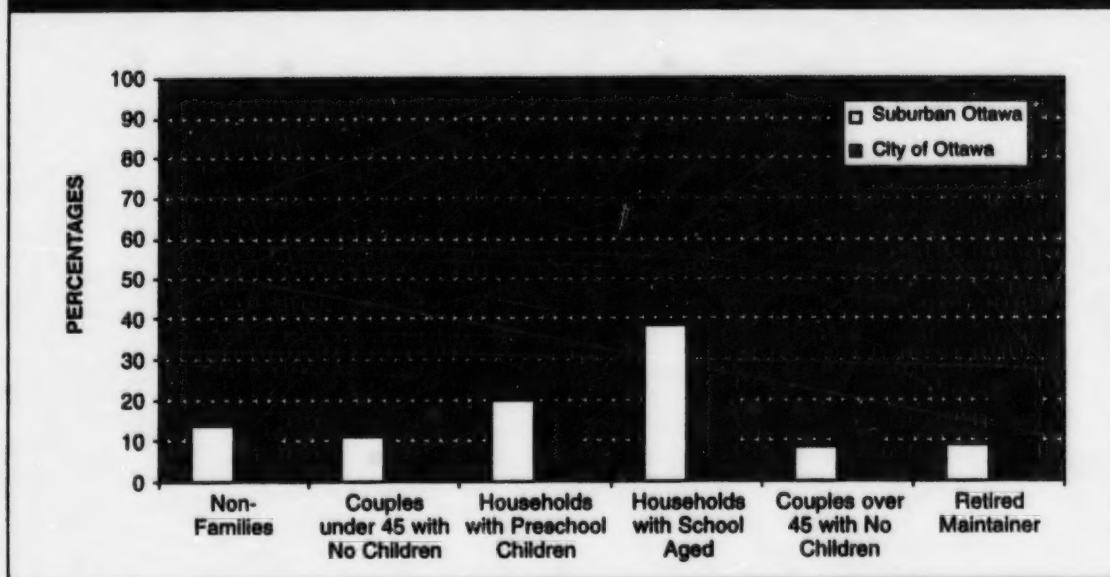


Figure 8B  
Household Type Distribution by Target Groups

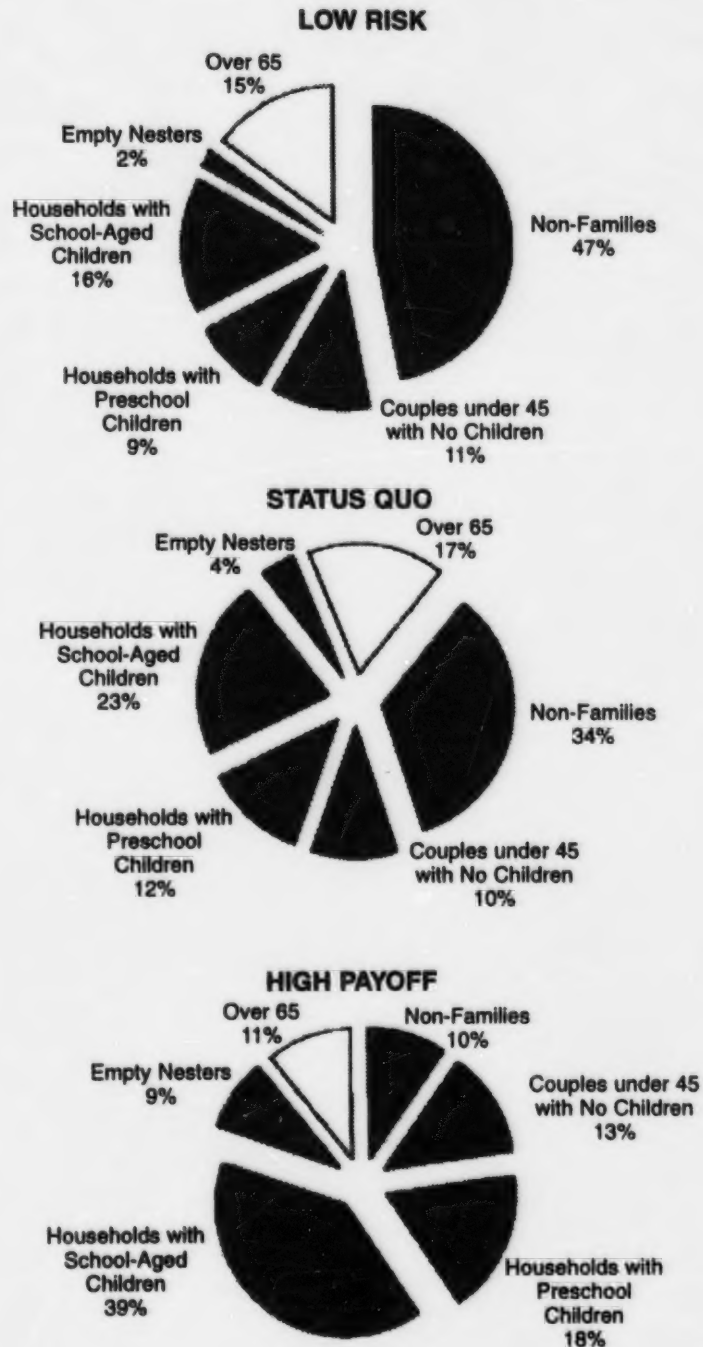


**Table 6** Proposed size and price distribution for medium-density homeownership units in the City of Ottawa and in the suburban municipalities

| Number of Bedrooms | City of Ottawa       |                   |     | Suburban Municipalities |                   |     |
|--------------------|----------------------|-------------------|-----|-------------------------|-------------------|-----|
|                    | Bedroom Distribution | Price Range \$000 |     | Bedroom Distribution    | Price Range \$000 |     |
| 1                  | 4                    | 140K              | 190 | 2                       | 115               | 150 |
| 2                  | 20                   | 170K              | 230 | 10                      | 135               | 170 |
| 3                  | 60                   | 180K              | 240 | 70                      | 145               | 180 |
| 4                  | 16                   | 190K              | 250 | 18                      | 155               | 200 |

The bedroom distribution illustrated in Figure 9 shows a difference between the city and suburban profiles: close to 20 per cent of households in both the city and suburbs want four-bedroom dwellings while only seven per cent of the current duplex and townhouse stock has units of this size. The combined profile has also more one-bedroom units (four per cent) compared to the existing stock (2.6 per cent) but most of these are in the City of Ottawa. The suburban projects will have more three-bedroom units and fewer two-bedroom units.

The building program can offer unit size distributions and price ranges as described in Table 6 and illustrated in Figure 10. The low end of the price range is set to lie just below the mean value of the units in the combined target. The high price in the range is determined by adding one standard deviation in the price of the existing units to the area. Luxury projects will be priced higher than indicated in Table 6.

## Conclusions

The duplex and townhouse option is the main substitute for single-family houses. The market share enjoyed by this building type stays relatively constant for households earning between \$40,000 and \$110,000 a year. Increasing housing prices relative to income levels are expected to increase the market share to over 30 per cent. With one exception, changing demographic profiles will contribute only a little to the growth of this sector. The increasing proportion of households with women as primary

maintainers will increase the demand for medium-density housing. The increasing proportion of non-family households will increase the demand for dwellings in apartment buildings and contribute to the goal of making cities more compact. However, the change is relatively small and can explain approximately a three per cent shift in the market share from single-family detached housing to the apartment sector. The increase in the proportion of non-family households will tend to reduce the demand for medium-density housing. This loss will be offset by increases in lone-parent households and in small households formed by couples without children. The projected market share for this option is in the 30 per cent range.

These projections do not account for changes in preferences over time, and for changes in the relative price of options and in the options available on the market. Trends, influenced by recent conditions in Ottawa, have shown an increase over the last 10 years in the share of freehold units going to the townhouse sector. Should the factors bringing about this increase continue to exert an effect on Ottawa's housing market over the next 15 years, then we might expect the share of medium-density housing to exceed 30 per cent while drawing households away from the single-family and apartment condominium markets.

The study shows that the market shares for higher-density housing will increase moderately over the next 20 years. Each household type forms a sizeable component of the market for

**Figure 9**  
Distribution of Units by Number of Bedrooms for the City of Ottawa and the Suburban Projects Aimed at Homeowners

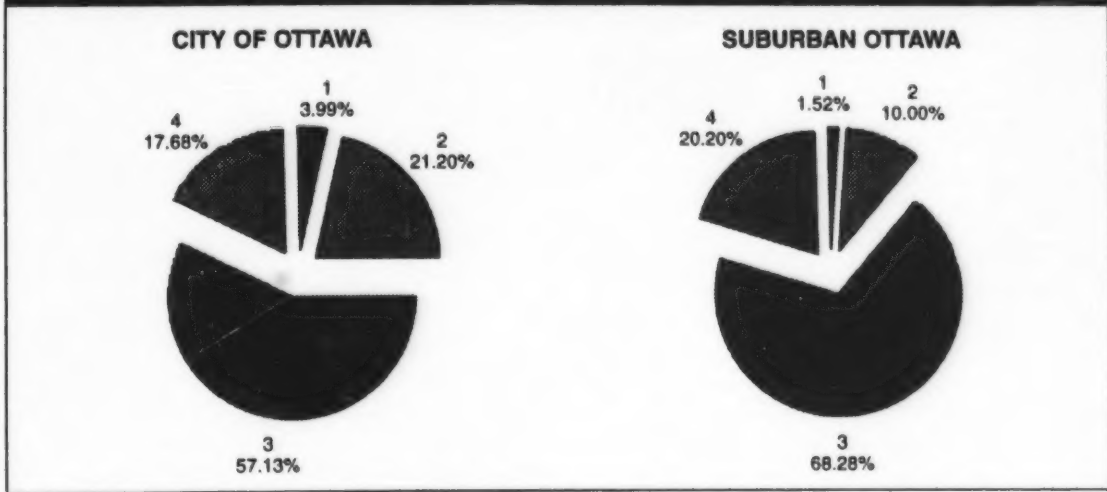
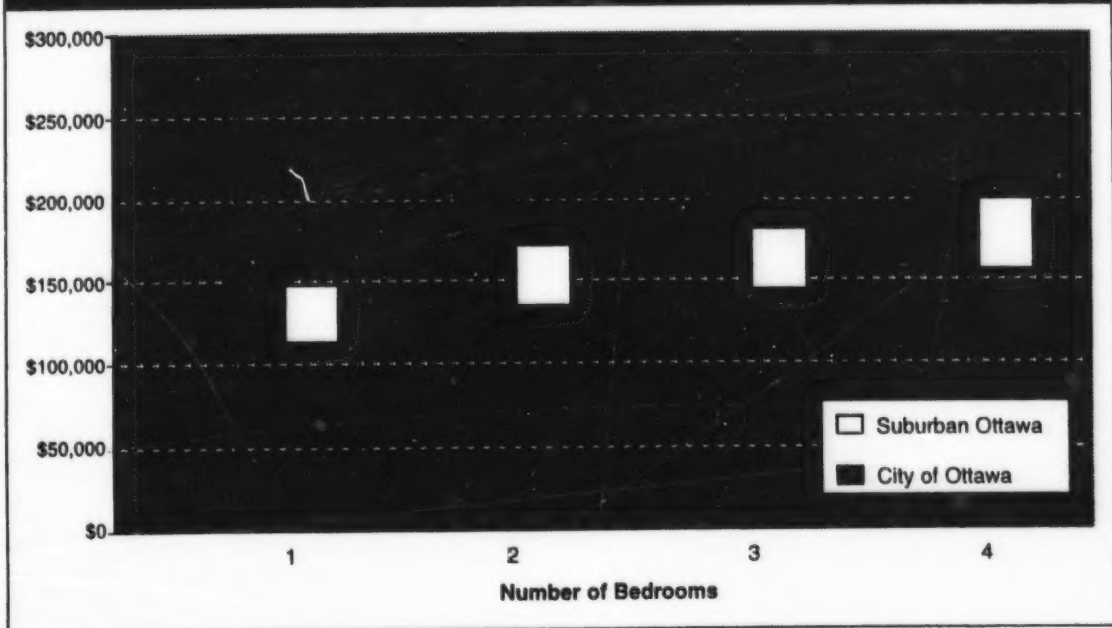


**Figure 10**  
Price Ranges for the City of Ottawa and the Suburban Townhouse Projects by Bedroom Number



medium-density housing. This means there is relatively little risk in developing prototypes to attract couples, families with children and non-family households. The main variant will be the absorption time.

The main factors differentiating single-family homeowners from the owners of units in medium density are, in descending order of importance:

- the presence of a child in a household;
- the age of the household maintainers (the older, the more likely that the household lives in a single-family detached house); and
- household income (the higher the household's income relative to the price of housing, the greater is the chance that the household will buy a single-family house).

The main factor affecting the forecast of demand for apartments will be the income level of future households. The demand for medium-density housing is, on the whole, not affected very much by income changes. The most important determinant of the future market share for this building type is public policy. In particular, the setting of development cost charge schedules to reflect the true social cost of the differences between higher- and lower-density projects and between greenfield and in-fill projects will change the relative price of the options and increase the market share of medium- and higher-density housing.

The primary challenge in developing more compact cities is in developing homeownership options within the medium-density housing that attracts family households with annual incomes between \$70,000 and \$90,000. This income range shows the greatest increase in the household's propensity to occupy single-family detached houses after controlling and accounting for the effects of the demographic factors and tenure choice.

The main conclusion developed in this report suggests that the compactness of the city is largely determined by the affluence of its residents. Increasing affluence increases the market share of single-family houses and the spread of cities. The projected demographic changes will only reinforce this tendency as the ageing population increases the proportion of those who can afford single-family houses. The increase in the proportion of non-family households will hold back the growth of the single-family sector but the net effect is positive: its market share is expected to increase as long as incomes rise faster than housing prices. Changes in development cost charge schedules, property tax regimes, land use and transportation planning approaches, growth management strategies, housing finance and mortgage insurance policies are among the vehicles for modifying the spread of cities. Policy, not demographics, will change the trajectory of urban development.

## ENDNOTES

---

- <sup>1</sup> Prices may increase due to reduced land availability or an increase in development cost charges. The price of houses relative to the price of medium-density housing may be affected by changes in development cost schedules, property taxes and even in financing costs and mortgage insurance policies.
- <sup>2</sup> By looking at a set of factors simultaneously we are able to identify the unique contribution of each factor, that is, the contribution of each factor after having controlled for the effect of all the other factors that are described by the variables that are included in the model. For instance, by including variables identifying households living in the City of Ottawa as opposed to the suburbs, the parameter estimates for a variable identifying the presence of children in the household will reflect the effect that children have on choice of building type independent of the household's choice of living in the city or in the suburbs. If the city variable was excluded, then the estimated parameter for the children's variable might be biased by the fact that households with children may tend to occupy single-family houses because they want a suburban location and suburban locations have the most single-family houses.
- <sup>3</sup> The logistic regressions from which these conclusions are derived are in the technical report by A. Skaburskis (1997) *Characteristics of Market Demand for Different Building Types in the Larger Cities of Ontario: The Development of a Building Program for Prototypes that Would Help Develop More Compact Urban Form*, CMHC, Ottawa.
- <sup>4</sup> The calculation is as follows. Given a probability of a particular choice, say 0.80, then compute the odds a person makes the choice, i.e.,  $\text{odds} = 0.80 / (1 - 0.80) = 4$ . If the partial odds ratio for a variable is, say, 0.5, then the odds the person with the characteristic described by the variable is  $4 * 0.5 = 2$ . To translate the new odds ratio back into a probability statement, divide the odds ratio by one plus the odds ratio, i.e.,  $2 / (1 + 2) = 0.67$ .
- <sup>5</sup> The same model run with data from all major Ontario cities shows income to be the most influential factor and age the second most important.
- <sup>6</sup> While this factor does not describe a "household characteristic," its inclusion in the statistical model helps develop unbiased estimates of the parameters describing the household characteristics as explained in Endnote 3.
- <sup>7</sup> The focus group analysis is reported in Hok-Lin Leung (1997) *Multifamily Housing for Community Sustainability: Task Four Focus Group Report* CMHC, Ottawa.
- <sup>8</sup> Please see the working paper, *The Relationship Between Building Type and Household Characteristics: An Analysis of Ontario Cities Using the 1991 Census Data*, p. 48 for a technical description of the statistical models used to develop this prediction.